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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,281	07/17/2006	Seiichiro Yamamoto	47233-5002-00 (216113)	1577
55694 7590 06/15/2011 DRINKER BIDDLE & REATH (DC) 1500 K STREET, N.W. SUITE 1100 WASHINGTON, DC 20005-1209				
EXAMINER COLEMAN, RYAN L				
ART UNIT		PAPER NUMBER		
1714				
NOTIFICATION DATE		DELIVERY MODE		
06/15/2011		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DBRIPDocket@dbp.com  
penelope.mongelluzzo@dbp.com

### Office Action Summary

**Application No.**

10/551,281

**Applicant(s)**

YAMAMOTO ET AL.

**Examiner**

RYAN COLEMAN

**Art Unit**

1714

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 April 2011.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 and 11-22 is/are pending in the application.  
4a) Of the above claim(s) 3-6 and 11-22 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1 and 2 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-945)  
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. Applicant's amendments filed April 5, 2011 are acknowledged. Claims 7-10 have been canceled. Claims 1-6 and 11-22 are pending, and claims 3-6 and 11-22 have been withdrawn from consideration.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1 and 2 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,235,147 to Lee et al. (hereafter referred to as "Lee").

6. With regard to claim 1, Lee teaches a method of discharging solid semiconductor wafer contaminants from the inside of a treatment bath (item 10 in Figure 10; reads on *container*; Col. 1, 8-12; Col. 4, 17-22; Col. 5, 14-37; Col. 7, 4-12; Col. 9, 39-45). As shown in Figure 10, some semiconductors (and their to-be-discharged contaminants, which read on applicant's *solid matter*) are positioned (that is, stored) in an area between a horizontal conduit (unlabeled in Figure 10) that supplies liquid chemical to a spray line (item 22 in Figure 10) and the top of the liquid chemical level in the bath, and this area between the horizontal conduit and the top of the liquid chemical level in the bath is considered to read on applicant's *intermediate section*. Lee teaches supplying liquid chemical (applicant's *discharging chemical*) to nozzles (items 21 in Figure 10) located in an area beneath the horizontal conduit that supplies liquid chemical to the spray line (Col. 7, 4-12; Figure 10), and this area beneath the horizontal conduit that supplies liquid chemical to the spray line is considered to read on applicant's *lower section of said container* because it is lower than the area between the horizontal conduit that supplies liquid chemical to the spray line and the top of the liquid chemical level in the bath. Lee teaches supplying the liquid chemical to the nozzles located in the area beneath the horizontal conduit in order to contribute to making a vortex flow

(applicant's *spiral flow*) of liquid chemical within the treatment bath (Col. 5, 14-37 and Col. 9, 39-45; Figure 10). In the generation of the vortex flow within the treatment bath, the vortex flow is considered to be provided *from said lower section to said intermediate section* because nozzles are arranged from below the horizontal conduit that supplies liquid chemical to the spray line to above the horizontal conduit that supplies liquid chemical to the spray line (Figure 10), and when the nozzles begin to inject liquid chemical into the treatment bath in order to generate the vortex flow, the volume of liquid injected into the treatment bath (applicant's *a liquid volume*) increases. Lee does not explicitly teach that the vortex flow of liquid chemical causes a vortex flow of removed semiconductor contaminates, but since Lee teaches generating a vortex flow of the liquid chemical during the processing of the wafers (Col. 5, 14-37; Col. 9, 39-45) and since Lee teaches that the wafer contaminates are mixed with the liquid chemical such that the liquid chemical and contaminates are discharged together from the treatment bath (Col. 7, 4-12), Lee is reasonably expected to have a vortex flow of a mixture of liquid chemical and removed semiconductor contaminates. In Lee's method, when the injected liquid chemical begins to generate vortex flow in the area between the horizontal conduit and the top of the liquid chemical level in the bath, the rate of vortex flow will have to accelerate from zero to some higher rate, and therefore, the generation of the vortex flow is considered to be a process wherein the vortex flow is *gradually* generated. In Lee's method, the vortex flow of liquid chemical and entrained semiconductor contaminates is discharged through a discharge port in the bath's bottom (Col. 4, 17-22; Col. 5, 14-37; Col. 7, 4-12; Col. 9, 39-45). Lee does not explicitly teach

that *most* of the solid contaminants in the vortex flow of liquid chemical are discharged from the bath, but since Lee teaches that the solid contaminants are entrained in a vortex flow of liquid chemical that is discharged out of the bath's discharge port, it is reasonably expected that most of the solid contaminants in the vortex flow of liquid chemical are discharged from the bath's discharge port.

7. With regard to claim 2, as shown in Figure 10, the nozzles (item 21 in Figure 10) are in the *vicinity* of the bottom of the treatment bath because the nozzles are near the bottom of the treatment bath. Lee teaches having the nozzles discharge liquid chemical in a tangential direction such that the nozzles generate a vortex flow of liquid (Col. 5, 14-37; Figure 8).

### ***Response to Arguments***

8. Applicant's arguments filed March 15, 2011 have been fully considered but they are not persuasive.

9. Applicant amended claim 1 by adding a limitation specifying *storing said solid matter in an intermediate section of said container* prior to a limitation specifying *supplying a discharging liquid into a lower section of said container so as to generate a spiral flow of said liquid*. Applicant argues that listing the storing step prior to the supplying step overcomes the Lee reference because Lee teaches immersing his semiconductor wafers in a filled treatment bath – not storing the semiconductor wafers and then filling the treatment bath. However, in the method of Lee, after the semiconductor wafers are immersed in the filled treatment bath, liquid chemical is

sprayed into the treatment bath from nozzles (item 21 in Figure 10) located in the area beneath the horizontal conduit (unlabeled in Figure 10) that supplies liquid chemical to a spray line (item 22 in Figure 10; Col. 7, 4-12), and it is this step of supplying liquid chemical from nozzles located in the area beneath the horizontal conduit that is considered to read on applicant's *supplying* step. Applicant's *storing* step and *supplying* step do not distinguish the claimed invention from the method of Lee.

10. Applicant argues that since the nozzles of Lee are located throughout the bath 10, spiral flow of liquid cannot be provided from a lower section to an intermediate section by increasing a liquid volume. However, as discussed above in the rejection of claim 1, Lee teaches supplying the liquid chemical to the nozzles located in the area beneath the horizontal conduit in order to contribute to making a vortex flow (applicant's *spiral flow*) of liquid chemical within the treatment bath (Col. 5, 14-37 and Col. 9, 39-45; Figure 10). In the generation of the vortex flow within the treatment bath, the vortex flow is considered to be provided *from said lower section to said intermediate section* because nozzles are arranged from below the horizontal conduit that supplies liquid chemical to the spray line to above the horizontal conduit that supplies liquid chemical to the spray line (Figure 10), and when the nozzles begin to inject liquid chemical into the treatment bath in order to generate the vortex flow, the volume of liquid injected into the treatment bath (applicant's *a liquid volume*) increases.

***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

12. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to RYAN COLEMAN whose telephone number is (571)270-7376. The examiner can normally be reached on Monday-Friday, 9-5.

14. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Kornakov can be reached on (571)272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for



published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/RLC/

Ryan L. Coleman

Patent Examiner, Art Unit 1714

June 8, 2011

/Michael Kornakov/

Supervisory Patent Examiner, Art Unit 1714